A NEW AVIAN TREMATODE.

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(*Communicated by Professor S. J. Johnston, B.A., D. Sc.*)

(Plate xxvi.; and one Text-figure.)

Introduction.

The presence of *Holostomum* as an endoparasite of herons has been recorded by two authors. Brandes (1891, p. 594) records *H. cornu* Nitzsch and *H. cinctum* Brandes from various species of *Ardea*. Johnston (1904, p. 112) described, under the name of *Holostomum simplex*, a trematode from the intestine of the white-fronted heron *Notophoyx novae-hollandiae*, collected at Creel Bay, Broken Bay, N.S.W.

I record here the occurrence of another species of *Holostomum* in this heron, my description being based on three preserved specimens, one of which had been mounted whole, and two sectioned by Prof. S. J. Johnston, who had collected them at Terrigal, N.S.W. The limited and imperfect nature of the material, and, in particular, the lack of living specimens has prevented more than a summary description being given.

Description of the New Species.

Family HOLOSTOMATIDAE.

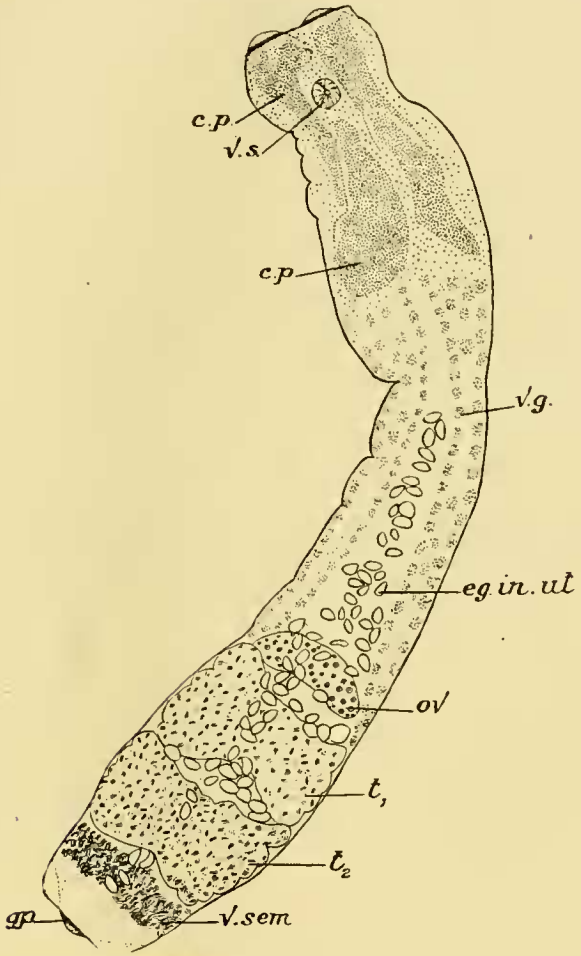
Subfamily HOLOSTOMEAE.

Genus Holostomum Nitzsch.

Holostomum repens, n.sp. (Pl. xxvi., figs. 1-5.)

External Characters.—H. repens is 6 mm. in length and shows the usual division into two regions, not well marked off from one another, the anterior 2 mm. and the posterior 4 mm. long. The latter is narrower than the anterior region, the diameter increasing towards the posterior end, and being greatest in the region of the testes, where it exceeds the width of the fore part of the body. In preserved specimens the dorsal surface has a concave curvature, owing to the contracted condition of the dorsal longitudinal muscle bands.

The clinging plug extends a short distance beyond the margin of the beaker-shaped anterior region, and the genital papilla also projects a short distance from the bursa posteriorly. (Text-fig. 1.)



Text.fig.1.—*Holostmum repens*, n.sp.

In all the described species of *Holostomum*, the oral sucker and the pharynx are both well-defined structures, but in *H. repens* only one cavity with thick muscular walls is found in connection with the mouth. With the limited amount of material at my disposal, a difficulty has been experienced in determining whether this structure represents an oral sucker, or pharynx, or a union of the two. In the Trematoda the absence of a pharynx is not common, although it

does occur in some genera, *e.g.*, *Gorgodera*, but here the conclusion is forced upon me that the pharynx is present, and that no distinct oral sucker is represented. The posterior sucker, 0.133 mm. long, 0.095 mm. broad, with thickness of walt, 0.038 mm., opens into the narrow cavity between the dorsal body wall and the median process of the clinging plug.

The Clinging Plug.—The clinging plug comprises (1) a main ovoid mass, larger basally, divided into two lateral lobes by an oblique septum running from the dorsal body wall at half its length anteriorly to the ventral wall at its hinder level posteriorly. In this septum run the two branches of the alimentary canal and certain large excretory spaces (Pl. xxvi., fig. 4, *int. ex.*). Anteriorly the mass projects forward as two smaller lateral lobes, which end a little forward of the narrowest diameter of the cup (Pl. xxvi., fig. 3, *d. w.*); (2) a median process attached to the dorsal body wall anterior to the main lobes, narrowing distally, and enlarging into two small flattened lobes, capable of being bent over towards the ventral wall (Pl. xxvi., fig. 3, *m.d.p.*), but, when extended, reaching to the border of the cup; (3) a lamellar fold arising from the ventral body wall at the anterior level of the main mass, and expanding on both sides to form a collar embracing the median process, and the dorsal and ventral processes next mentioned (Pl. xxvi., fig. 3, *v.w.*); (4) a capitate process arising from the base of the median lobe dorsally and extending forwards to the level of the cup margin (Pl. xxvi., fig. 3, pr_2); and (5) a similar larger ventral process arising at the base of the lamellar fold, and projecting forwards to the same distance (Pl. xxvi., fig. 3, pr_1).

The main ovoid mass of the plug arises from the dorsal body wall posterior to the narrowest region of the cup (Pl. xxvi., fig. 3). It is divided into two lateral lobes, into which muscle fibres pass through the base of attachment from both an anterior and posterior direction. Vitelline glands are found throughout this division of the plug, but do not occur in any of the other processes.

The large gland spoken of by Brandes (1891, p. 360) as secreting a corroding substance, is situated just behind the base of attachment of this main dorsal mass (Pl. xxvi., fig. 2, *gl.*). The arrangement of the follicles of the gland point to the fact that the secretion is carried forward by a number of fine ducts, but no connection can be traced between this gland and certain ducts containing a definite secretion, which appear at the posterior extremity of the main mass of the plug, and run forward in the accessory processes.

The cup in which the plug lies occupies almost one third of the total body length, and is divided posteriorly into two lateral cavities by the oblique septum before mentioned (Pl. xxvi., fig. 4, *c.c.*).

Musculature.—Lying directly below the cuticle are two layers of muscle fibres, an outer circular, and an inner longitudinal layer. In addition, definite strands of oblique muscle extend through the parenchyma from the outer to the inner wall of the cup.

The region of the ventral sucker is very muscular, and it is here that the two main dorsal longitudinal bands of muscle have their origin. These bands run back below the dorsal surface to the posterior end of the body, and add greatly to the effectiveness of the plug as explained by Brandes (1891, p. 559). Contraction of these fibres causes a sharpening of the angle between the anterior and posterior regions, and the pressure of the individual parts of the plug against one another.

The dorsal median process of the clinging plug has numerous fibres at its base, and the bifid extremity is capable of being bent back on itself by the contraction of the fibres contained within these lobes (Pl. xxvi., fig. 3, *m.d.p.*).

There is a strong layer of circular muscle in the parenchyma of the wall surrounding the main ovoid mass of the plug, and it is continuous with the fibres, which run into the septum dividing the cavity of the cup (Pl. xxvi., figs, 2, 4 *cm.*).

Alimentary Canal.—Owing to the absence of a definite oral sucker as stated above, the mouth leads directly into a pharynx 0.114 mm. long, 0.057 mm. broad, with thickness of wall 0.019 mm.

The intestine is dorsal in position in fore part of the body, but (Pl. xxvi., fig. 4, *int.*) shows the two limbs crossing over in the septum to take up a ventral position in the posterior cylindrical region (Pl. xxvi., fig. 5, *int.*).

Excretory System.—There is a ramifying system of excretory vessels, but with the present imperfect specimens I am unable to give a detailed account of their distribution.

Reproductive System.—The reproductive system of *H. repens* is very similar to the description given by Brandes (1891, p. 590, Pl. xli., fig. 1) for *H. variabile*. The genital organs are, however, confined to the posterior third of the animal. The uterus, with the exception of its connection with the *vesicula seminalis*, has the same relations as in *H. variabile*. In the latter the *vesicula seminalis* opens into the uterus at the base of the genital papilla, whereas in *H. repens* it joins the female duct near the extremity of the papilla (Pl. xxvi., fig. 1).

The eggs are large, 0.095 × 0.076 mm.; 0.133 × 0.095 mm.

There are numerous vitelline glands, which extend into the anterior region, and are found in the two swollen masses of the dorsal wall of the plug (Pl. xxvi., fig. 2, *v.g.*). In the region of the reproductive organs, the follicles are confined to a ventral position, but they do occur dorsally both in front of and behind these organs.

Affinities.—*H. variabile* Nitzsch, according to Brandes (1891, p. 590, Pl. xli., fig. 1), is closely allied to *H. repens* in the general arrangement of the organs, but in shape *H. repens* is considerably more elongated, and the plug occupies a much greater proportion of the body. *Holostomum simplex* Johnston (1904, p. 112, Pl. vii., figs. 1-3), from the same host, has somewhat the same form, but the clinging plug is of a simpler type. In no other species described have I found the absence of oral sucker noted.

Host.—From the intestine of *Notophoyx novae-hollandiae*, collected at Terrigal, N.S.W.

Type No. W.544 in the Australian Museum, Sydney.

References.

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Explanation of Plate xxvi.

Holostomum repens, n.sp.

Fig. 1.—Reconstruction of posterior region, showing relations of the reproductive organs.
Fig. 2.—Transverse section through the main lateral lobes of the dorsal wall of the plug.
Fig. 3.—Reconstruction of anterior region, showing various processes of the clinging plug.
Fig. 4.—Transverse section through the posterior region of the cup.
Fig. 5.—Transverse section through the testes, shell gland, uterus, vas deferens.

Explanation of Lettering for Text Figure and Plate.

b.c. bursa copulatrix; *c.c.* cavity of cup; *cm.* circular muscle; *c.p.* clinging plug; *d.lm.* dorsal longitudinal muscle; *d.w.* dorsal wall of plug; *e.g.* eggs; *eg. in ut.* eggs in uterus; *ex.* excretory vessel; *gl.* gland; *g.p.* genital papilla; *int.* intestine; *lc.* laurer's canal; *lt.* lobes of testis; *m.d.p.* median dorsal process of plug; *m.v.d.* single unpaired vitelline duct; *ov.* ovary; *oot.* ootype; *ovid.* oviduct; *ph.* pharynx; pr_1. process arising from base of ventral lamellar wall; pr_2. process arising from base of median dorsal lobe; *r.s.u.* receptaculum seminis uterinum; *sh.g.* shell gland; t_1. anterior testis; t_2. posterior testis; *td.* transverse yolk duct; *ut.* uterus; *vd.* vas deferens; *v.g.* vitelline glands; *v.s.* ventral sucker; *v. sem.* vesicula seminalis; *v.w.* ventral lamellar wall of plug; *y.r.* yolk reservoir.